Computer Networks-Lab 01

Instructor: Hurmat Hidayat

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NATIONAL UNIVERSTIY OF COMPUTER AND EMERGING SCIENCES, FAST- PESHAWAR CAMPUS
Department of Computer Science & Software Engineering

Computer Networks - Lab 01

OBJECTIVES OF THE LAB

Following topics will be covered in this lab

- Gather information including connection, host name, Layer 2 MAC address and Layer 3 TCP/IP network address information.
- Compare network information to other PCs on the network.
- Identify tool used for discovering a computer's network configuration.
- Understand basic network information & configuration from computer through ipconfig/ifconfig and ns lookup commands.
- Introduction with Network adapter and its working.
- Perform some network adapter operations using ipconfig/ifconfig.
- Find the IP of a system with 8 different methods.

Contents

Computer Networks

Computer networks are the basis of communication in IT. They are used in a huge variety of ways and can include many different types of networks. A computer network is a set of computers that are connected together so that they can share information. The earliest examples of computer networks are from the 1960s, but they have come a long way in the half-century since then.
Computer networking refers to interconnected computing devices that can exchange data and share resources with each other. These networked devices use a system of rules, called communications protocols, to transmit information over physical or wireless technologies.

Terminologies

IP address

Every machine on a network has a unique IP address provides an identity to a networked device. Similar to a home or business address supplying that specific physical location with an identifiable address; devices on a network are differentiated from one another through IP addresses.
IPv4 uses 32bits to create a single unique address on the network. An Ipv4 address is expressed by four number separated by dots. Each number is the decimal (base 10) representation for an eight-digit binary (base-2) number, also called an octet. For example:

IP address: 216.27.61.137
Binary representation: 11011000.00011011.00111101.10001001

Public IP and Private IP

A **public IP address** is an IP address that can be accessed directly over the internet and is assigned to your network router by your internet service provider (ISP). A **private IP address** is the address your network router assigns to your device. Each device within the same network is assigned a unique private IP address (sometimes called a private network address) — this is how devices on the same internal network talk to each other.

Figure 1: Each device within the same network has a unique private IP address.

MAC Address

A MAC address, or Media Access Control address, is a 48-bit address associated with a network adapter. While IP addresses are associated with software, MAC addresses are linked to the hardware of network adapters. The MAC address is a unique value associated with a network adapter. MAC addresses are also known as hardware address or physical address. They uniquely identify an adapter on a LAN.

TCP

TCP stands for Transmission Control Protocol a communications standard that enables application programs and computing devices to exchange messages over a network. It is designed to send packets across the internet and ensure the successful delivery of data and messages over networks. TCP organizes data so that it can be transmitted between a server and a client. It guarantees the integrity of the data being communicated over a network.

DHCP

DHCP (Dynamic Host Configuration Protocol) is a network management protocol used to dynamically assign an Internet Protocol (IP) address to any device, or node, on a network so they can communicate using IP. DHCP automates and centrally manages these configurations rather than requiring network administrators to manually assign IP addresses to all network devices. DHCP can be implemented on small local networks, as well as large enterprise networks.

DNS

The Domain Name System (DNS) is the phonebook of the Internet. Humans access information online through domain names, like nytimes.com or espn.com. Web browsers interact through Internet Protocol (IP) addresses. DNS translates domain names to IP addresses so browsers can load Internet resources.

Gather TCP/IP Configuration Information

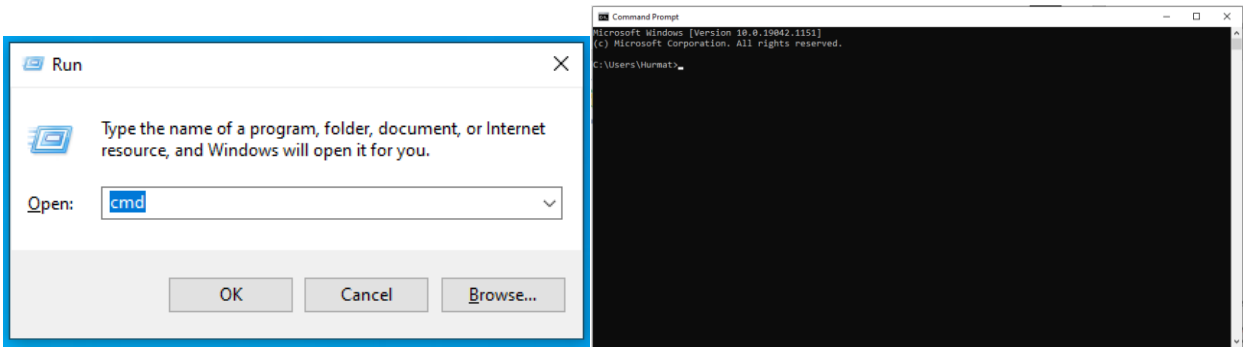
Ipconfig

The ipconfig is a Windows command-line utility used often to troubleshooting computer network issues. If you are a Linux user, this utility is similar to ifconfig. **Ipconfig** displays all current TCP/IP network configuration values and refreshes Dynamic Host Configuration Protocol (DHCP) and Domain Name System (DNS) settings. Used without parameters, **ipconfig** displays Internet Protocol version 4 (IPv4) and IPv6 addresses, subnet mask, and default gateway for all adapters.

While most of the information provided by the ipconfig command-line utility can be found via a more user-friendly graphical interface, sometimes that interface may not be available and command prompt is your only available option. If you are a help desk technician or a network professional, it is recommended that you understand the command-line method of retrieving a computer's network configuration, and it some cases, performing network functions.

Open Command Prompt

1. Search for cmd/Command Prompt using the built-in Windows search tool. OR
2. Press the keyboard combination **WinKey + R**, then type cmd at the *Run* window that appears.



Ipconfig Syntax

ipconfig [/allcompartments] [/all] [/renew [<adapter>]] [/release [<adapter>]] [/renew6[<adapter>]] [/release6 [<adapter>]] [/flushdns] [/displaydns] [/registerdns] [/showclassid <adapter>] [/setclassid <adapter> [<classID>]]

Ipconfig Parameters

Parameter	Description
/all	Display the full TCP/IP configuration information for all network adapters.
/release	Release the IPv4 address for the specified adapter.
/release6	Release the IPv6 address for the specified adapter.
/renew	Renew the IPv4 address for the specified adapter.
/renew6	Renew the IPv6 address for the specified adapter.
/flushdns	Purges the DNS Resolver cache.
/registerdns	Refreshes all DHCP leases and re-registers DNS names.
/displaydns	Display the contents of the DNS Resolver Cache.
/showclassid	Displays all the DHCP class IDs allowed for adapter.
/setclassid	Modifies the DHCP class ID.
/showclassid6	Displays all the IPv6 DHCP class IDs allowed for adapter.
/setclassid6	Modifies the IPv6 DHCP class ID.
/?	Displays help information.

There are a variety of switches (sub commands) available with the ipconfig utility that will either display certain information or perform certain network functions. At the most basic, the ipconfig

displays a computer's IP address, subnet mask and the default gateway (which is typically the IP address of your router or network firewall).

Retrieve Basic TCP/IP Network Information

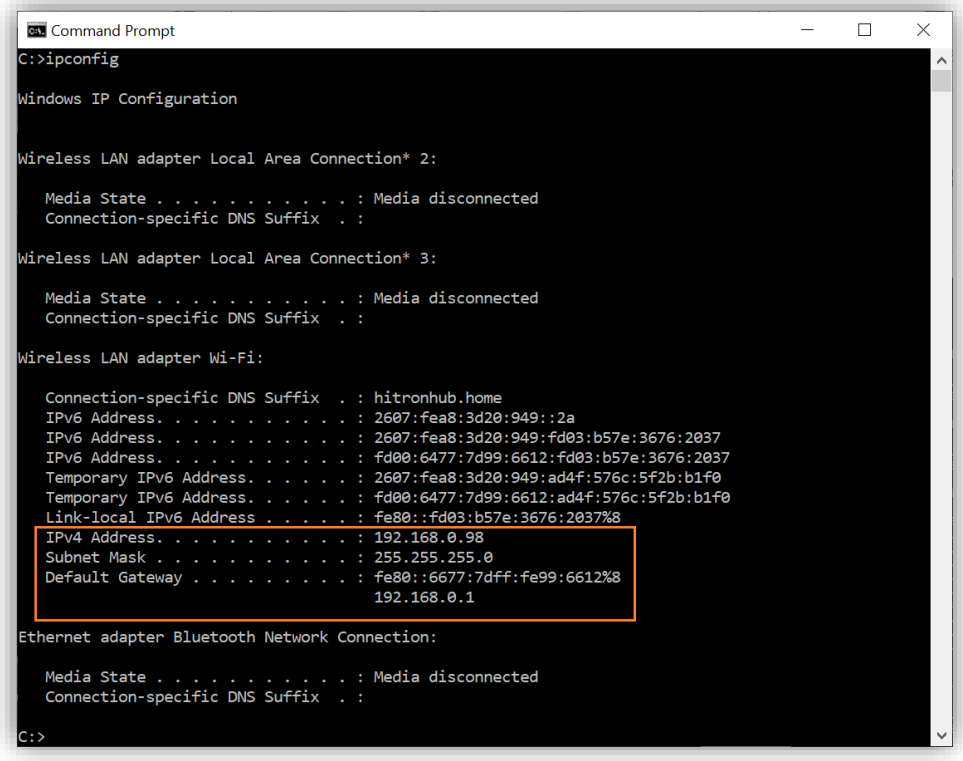
To get basic network information from your computer, type the following in the command window then press **Enter: ipconfig**

The screenshot example below is the ipconfig output of a particular computer. The output of your ipconfig result will differ depending on your network setup and the type of network adapters installed on your computer. In our screenshot example, it shows the following basic networking information about the computer from which ipconfig was ran.

- IPv4 address: 192.168.0.98
- Network subnet mask: 255.255.255.0
- Default Gateway: 192.168.0.1

Please note that unless your computer is connected directly to the Internet (this is rare), the IP address reported by ipconfig will be your local network IP, not your public external IP address.

While other network details can be retrieved by the ipconfig utility, for most network troubleshooting, this is what is typically needed.



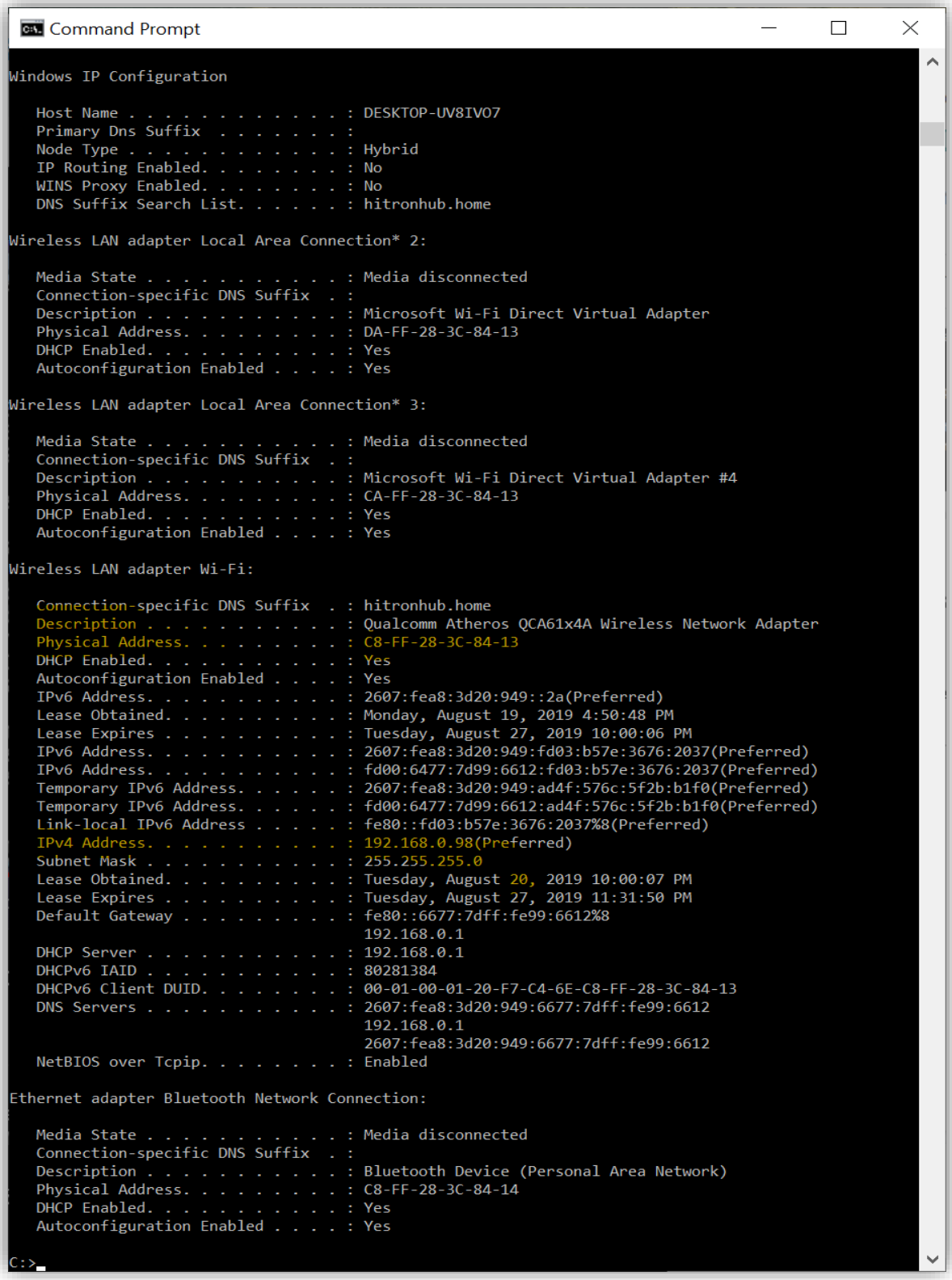
ipconfig /all - Retrieve All TCP/IP Network Information

Another useful switch with ipconfig is to have it report all TCP/IP network details for all network adapters on a computer. This is accomplished by using the /all switch. This switch provides you with the same basic information as ipconfig described above, but with a lot more detail. To retrieve all network information about your computer, type the following in the command window then press Enter: ipconfig /all

This shows a detailed report of various network details for the computer. Again, your report will differ depending on your network setup and the network adapters installed on your computer. This report includes information such as:

- Make and model of your network adapter(s)
- Physical address (also known as the MAC address or hardware address) of your adapter(s)
- Whether your IP address is leased (i.e., DHCP issued or statically assigned)
- If IP address is leased, what the lease expiration and the DHCP that leased it
- DNS servers

As you can see, ipconfig /all provides you with a plethora of details about your computer network setup.


Command Prompt
Windows IP Configuration
Host Name . . . . . : DESKTOP-UV8IVO7
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : hitronhub.home
Wireless LAN adapter Local Area Connection* 2:
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter
Physical Address. . . . . : DA-FF-28-3C-84-13
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
Wireless LAN adapter Local Area Connection* 3:
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter #4
Physical Address. . . . . : CA-FF-28-3C-84-13
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
Wireless LAN adapter Wi-Fi:
Connection-specific DNS Suffix . : hitronhub.home
Description . . . . . : Qualcomm Atheros QCA61x4A Wireless Network Adapter
Physical Address. . . . . : C8-FF-28-3C-84-13
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
IPv6 Address. . . . . : 2607:fea8:3d20:949::2a(Preferred)
Lease Obtained. . . . . : Monday, August 19, 2019 4:50:48 PM
Lease Expires . . . . . : Tuesday, August 27, 2019 10:00:06 PM
IPv6 Address. . . . . : 2607:fea8:3d20:949:fd03:b57e:3676:2037(Preferred)
IPv6 Address. . . . . : fd00:6477:7d99:6612:fd03:b57e:3676:2037(Preferred)
Temporary IPv6 Address. . . . . : 2607:fea8:3d20:949:ad4f:576c:5f2b:b1f0(Preferred)
Temporary IPv6 Address. . . . . : fd00:6477:7d99:6612:ad4f:576c:5f2b:b1f0(Preferred)
Link-local IPv6 Address . . . . . : fe80::fd03:b57e:3676:2037%8(Preferred)
IPv4 Address. . . . . : 192.168.0.98(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Lease Obtained. . . . . : Tuesday, August 20, 2019 10:00:07 PM
Lease Expires . . . . . : Tuesday, August 27, 2019 11:31:50 PM
Default Gateway . . . . . : fe80::6677:7dff:fe99:6612%8
192.168.0.1
DHCP Server . . . . . : 192.168.0.1
DHCPv6 IAID . . . . . : 80281384
DHCPv6 Client DUID. . . . . : 00-01-00-01-20-F7-C4-6E-C8-FF-28-3C-84-13
DNS Servers . . . . . : 2607:fea8:3d20:949:6677:7dff:fe99:6612
192.168.0.1
2607:fea8:3d20:949:6677:7dff:fe99:6612
NetBIOS over Tcpip. . . . . : Enabled
Ethernet adapter Bluetooth Network Connection:
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Bluetooth Device (Personal Area Network)
Physical Address. . . . . : C8-FF-28-3C-84-14
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
C:>

The results of IPConfig include the following information:

Host Name	The name of the computer on the network.
IPv4 Address	The IP address being used by the network connection.
Subnet Mask	The specific section of the network to which a computer is connected.
Default Gateway	The router or switch that the network connection goes through.
DHCP Server	The server that hands out IP addresses based on a DHCP protocol.
DNS Servers	Domain name servers for your network - these servers translate URLs to an IP address.
Connection-specific DNS Suffix	A connection specific DNS suffix is a DNS suffix that is related to a particular network interface. It can be used in addition to or instead of the Primary DNS suffix when performing DNS queries or DNS dynamic registrations.

MAC Address (OUI) Lookup Tool

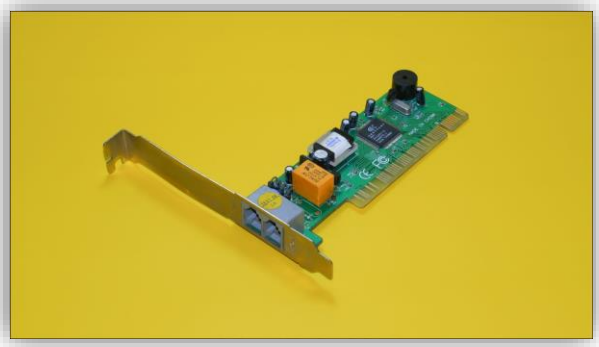
A MAC address, or Media Access Control address, is a 48-bit address associated with a network adapter. While IP addresses are associated with software, MAC addresses are linked to the hardware of network adapters. The MAC address is a unique value associated with a network adapter. MAC addresses are also known as hardware address or physical address. They uniquely identify an adapter on a LAN.

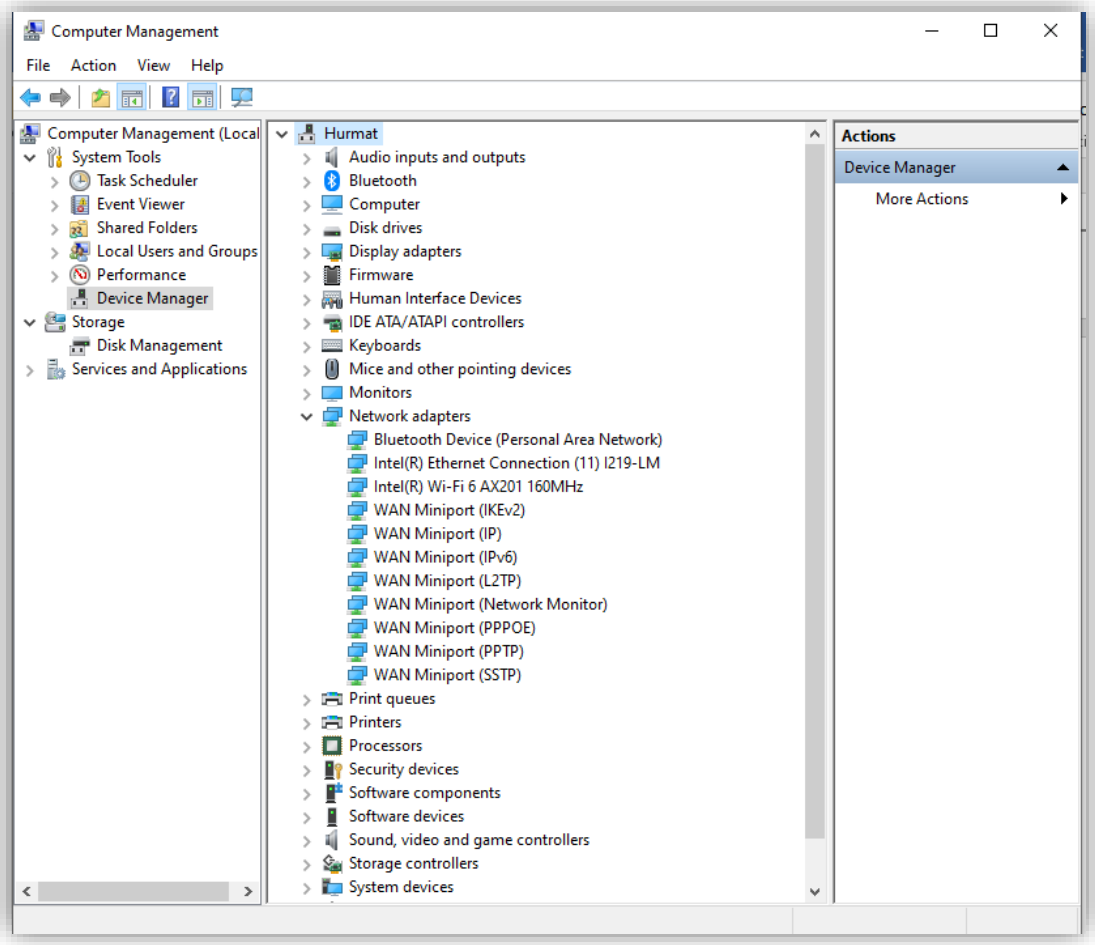
A MAC address is made up of six (6) octets. The first three octets indicate the manufacturer of the network adapter. Use this MAC Address (OUI) Lookup Tool to find the manufacturer of your adapter.

Network Adapter

A network adapter is the component of a computer's internal hardware that is used for communicating over a network with another computer. It enables a computer to connect with another computer, server or any networking device over a local area network (LAN) connection. A network adapter can be used over a wired or wireless network.

A network adapter is usually the only component within a computer for interfacing or connecting with a network. Typically, it is built on a printed circuit board with jumpers that connect it with the computer's motherboard.





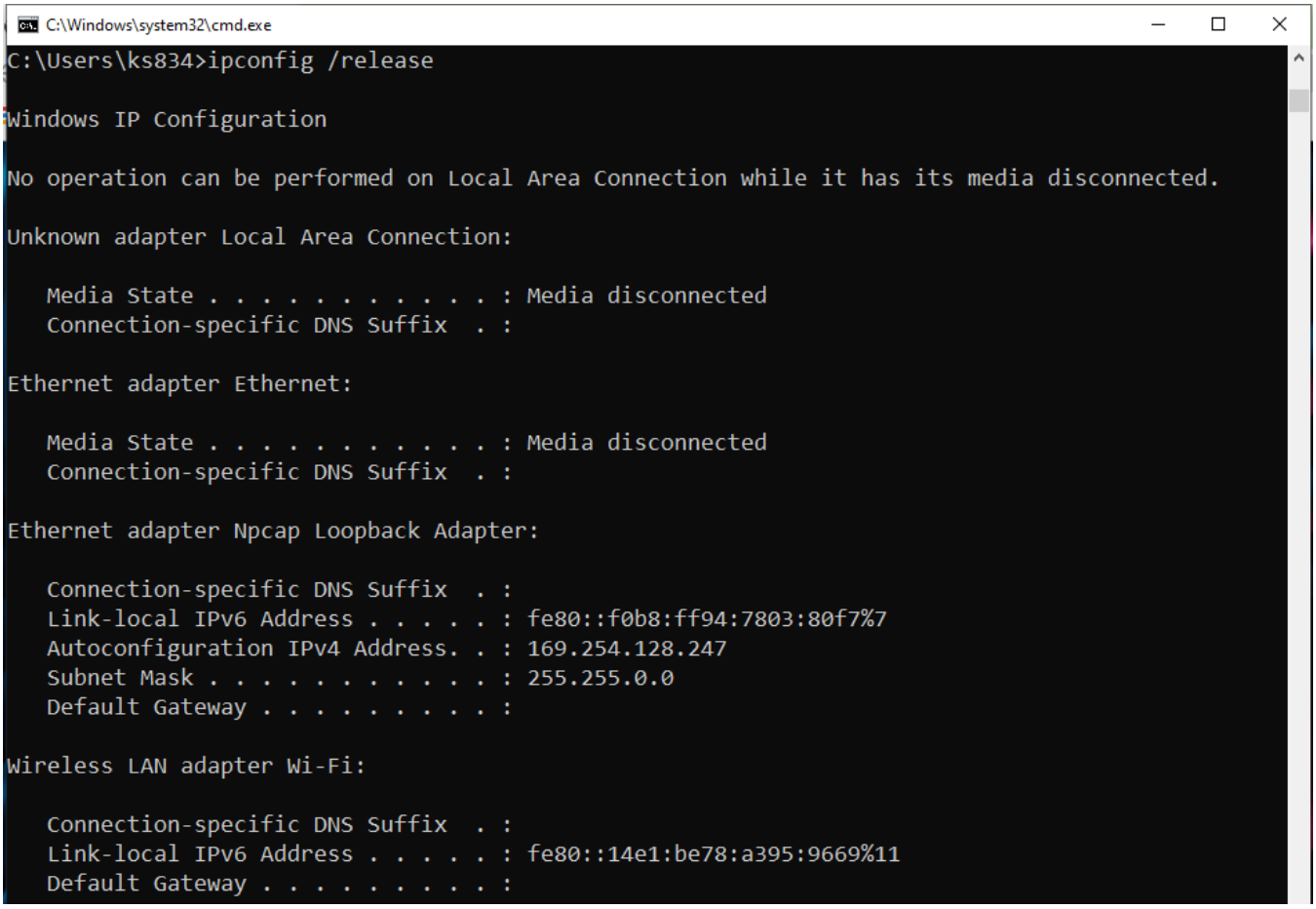
ipconfig /release - Releases the IPv4 Address of All Network Adapters

The /release switch will cause ipconfig to go through the network adapters you have and drop the dynamically issued IPv4 address by sending a DHCPRELEASE message to the DHCP server. For the majority of the time, you would follow this command with **ipconfig /renew** (described below) will cause your network adapters to reach out to your DHCP server for an IP address (it

can be a new IP address or the same IP you had prior to when you performed the /release command). For most, executing this command does not have adverse effect on your computer.

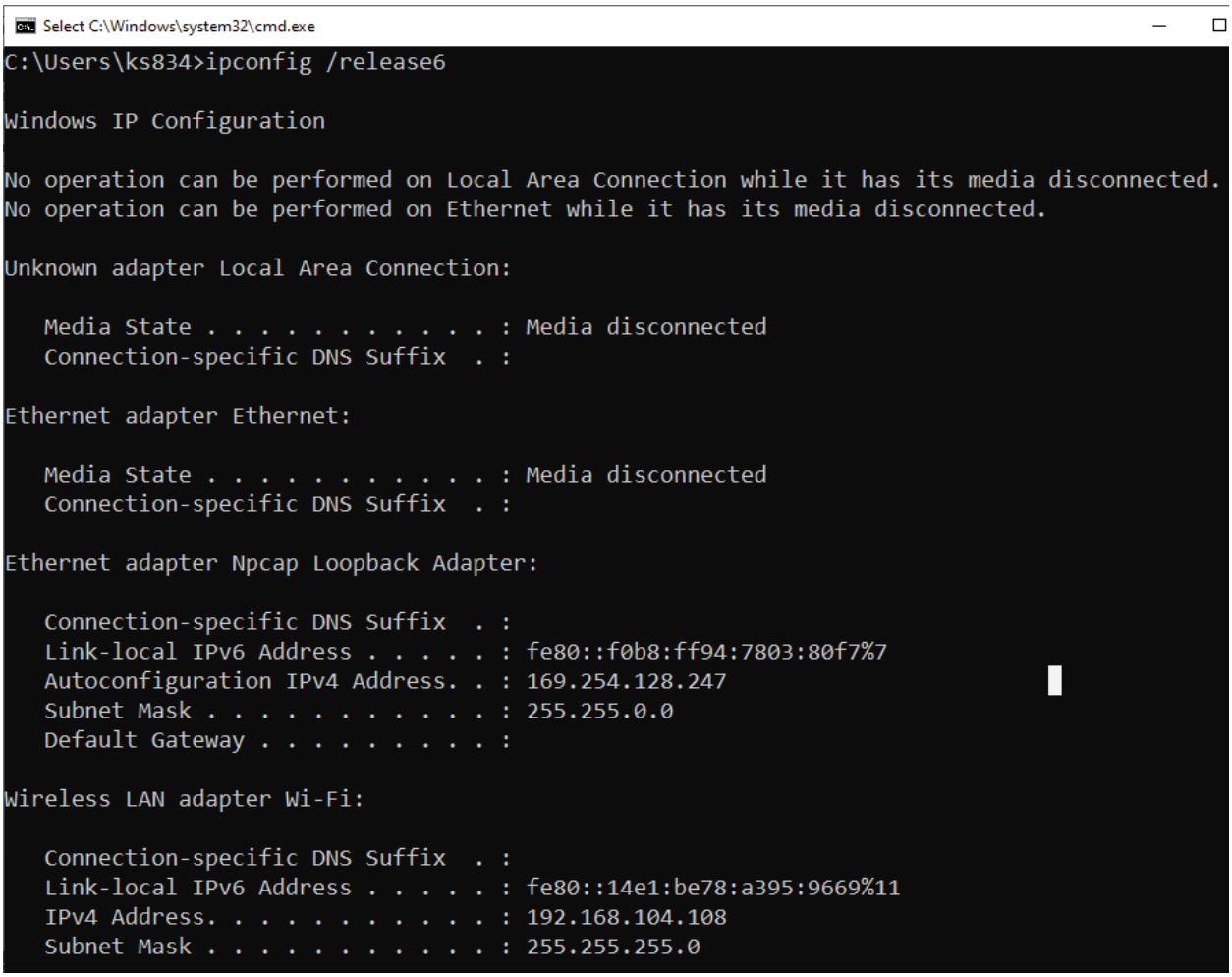
To release your IP address from your computer, type the following in the command window then press Enter:ipconfig /release

Note, if you have a statically assigned (manually assigned) IP address, this command will not release it. See example ipconfig /renew for related information.



ipconfig /release6 - Releases the IPv6 Address of All Network Adapters

The command is similar to ipconfig /release except it renews the IPv6 address on the adapters.



ipconfig /renew - Get a New IPv4 Address for All Network Adapters

The ipconfig /renew will cause your computer to reach out to your DHCP server for an IPv4 address if it doesn't already have one or renews an existing one for all network adapters. Depending on how your DHCP server is configured or the pool of available addresses, the IP address you will receive can be one you had previously or it can be a new IP address. Once you execute this command, it will typically take just seconds for a DHCP to assign your computer with an IP address. In the illustration below, the IP address assigned to this computer is 192.168.226.132.

To renew the IP address of your computer, type the following in the command window then press Enter: ipconfig /renew

```
C:\Users\ks834>ipconfig/renew

Windows IP Configuration

No operation can be performed on Local Area Connection while it has its media disconnected.
No operation can be performed on Ethernet while it has its media disconnected.
An error occurred while renewing interface Npcap Loopback Adapter : unable to contact your DHCP server. Request has t
d out.

Unknown adapter Local Area Connection:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Ethernet adapter Ethernet:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Ethernet adapter Npcap Loopback Adapter:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::f0b8:ff94:7803:80f7%7
   Autoconfiguration IPv4 Address. . : 169.254.128.247
   Subnet Mask . . . . . . . . . . . : 255.255.0.0
   Default Gateway . . . . . . . . . :

Wireless LAN adapter Wi-Fi:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::14e1:be78:a395:9669%11
   IPv4 Address. . . . . . . . . . . : 192.168.1.13
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : fe80::1%11
                                       192.168.1.1
```

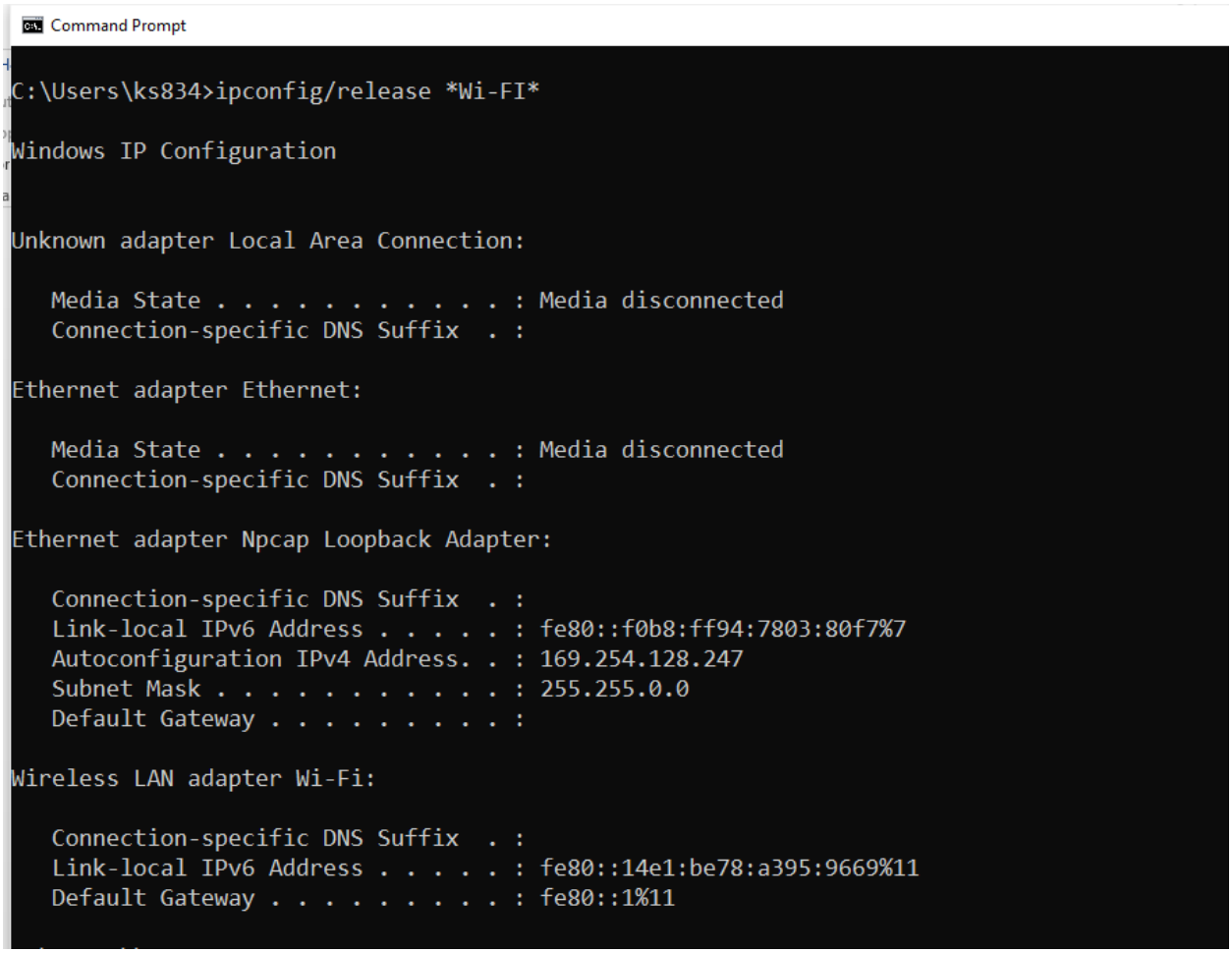
ipconfig /renew6 - Get a New IPv6 Address for All Network Adaptersipconfig /displaydns - View DNS Cache

The command is similar to ipconfig /renew except it renews the IPv6 address on the adapters.

ipconfig /renew <adapter> - Get a New IPv4 Address For a Specific Network Adapter

The ipconfig /renew <adapter> will cause your computer to reach out to your DHCP server for an IPv4 address if it doesn't already have one or renews an existing one for a **specific** network adapter. Depending on how your DHCP server is configured or the pool of available addresses, the IP address you will receive can be one you had previously or it can be a new IP address. Once you execute this command, it will typically take just seconds for a DHCP to assign your computer with an IP address. In the illustration below, the IP address assigned to the network adapter named " Wi-FI " is 192.168.226.132.

To renew the IP address for a network adapter on your computer named "Local Area Connection 3", type the following in the command window then press Enter: ipconfig/release *Wi-FI*. To find out the name(s) of the network adapters on your computer, type the following in the command window then press Enter: ipconfig



ipconfig /all | findstr /v 00-00-00 | findstr Physical - Display MAC Address of Only Physical Connected Network Adapters

The ipconfig utility, with the /all switch, is often used to find the MAC address (the 6-byte 'burned-in' physical/hardware address) of network adapters. While this does the job, the output shows a plethora of information as mentioned above. If you have multiple adapters, the output can be lengthy making it cumbersome to find what you are looking for.

The Windows findstr utility is used to search for patterns of text. By feeding the output of ipconfig /all into findstr, we can significantly reduce the clutter and have the output show only the MAC address of physical network adapters. To accomplish this, type the following in the command window then press Enter:

```
ipconfig /all | findstr /v 00-00-00 | findstr Physical
```

This command is actually a series of three commands, namely:

1. ipconfig /all
2. findstr /v 00-00-00

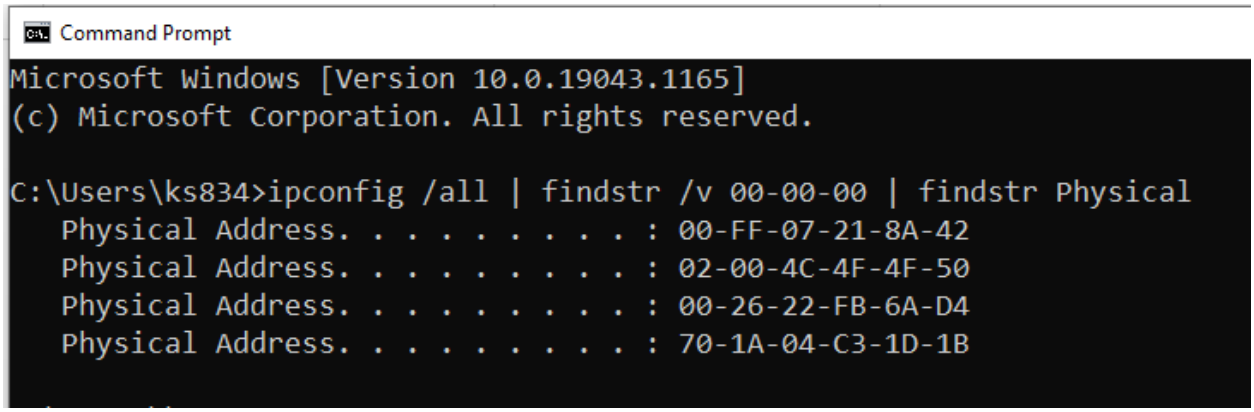
3. findstr Physical

The vertical bar (|), more commonly referred to as the pipe, is a 'command' that takes the output from the left side of the pipe and feeds it as input to the command on the right, bypassing the computer screen.

As the above command shows, the output of ipconfig /all is funneled into the command findstr /v 00-00-00 as its input. The findstr with the /v switch will look for lines of text in the output of ipconfig /all that does not contain 00-00-00. What this does is exclude any network adapters that are disabled or not connected. These network adapters will have MAC address that starts with 00-00-00.

The result from the first findstr will still contain a lot of information that we can further filter out, such as DHCP lease information. To further reduce clutter to ultimately end up with an output that lists only MAC address of physical adapters, we will need to funneled the output of the first findstr into a second findstr command. This second findster will filter out every line of text except those that has the word Physical.

This series of commands produce an output that is concise to show only the MAC address of connected network adapters. As the illustration below shows, this is a much easier report to read as oppose to using just using ipconfig /all.



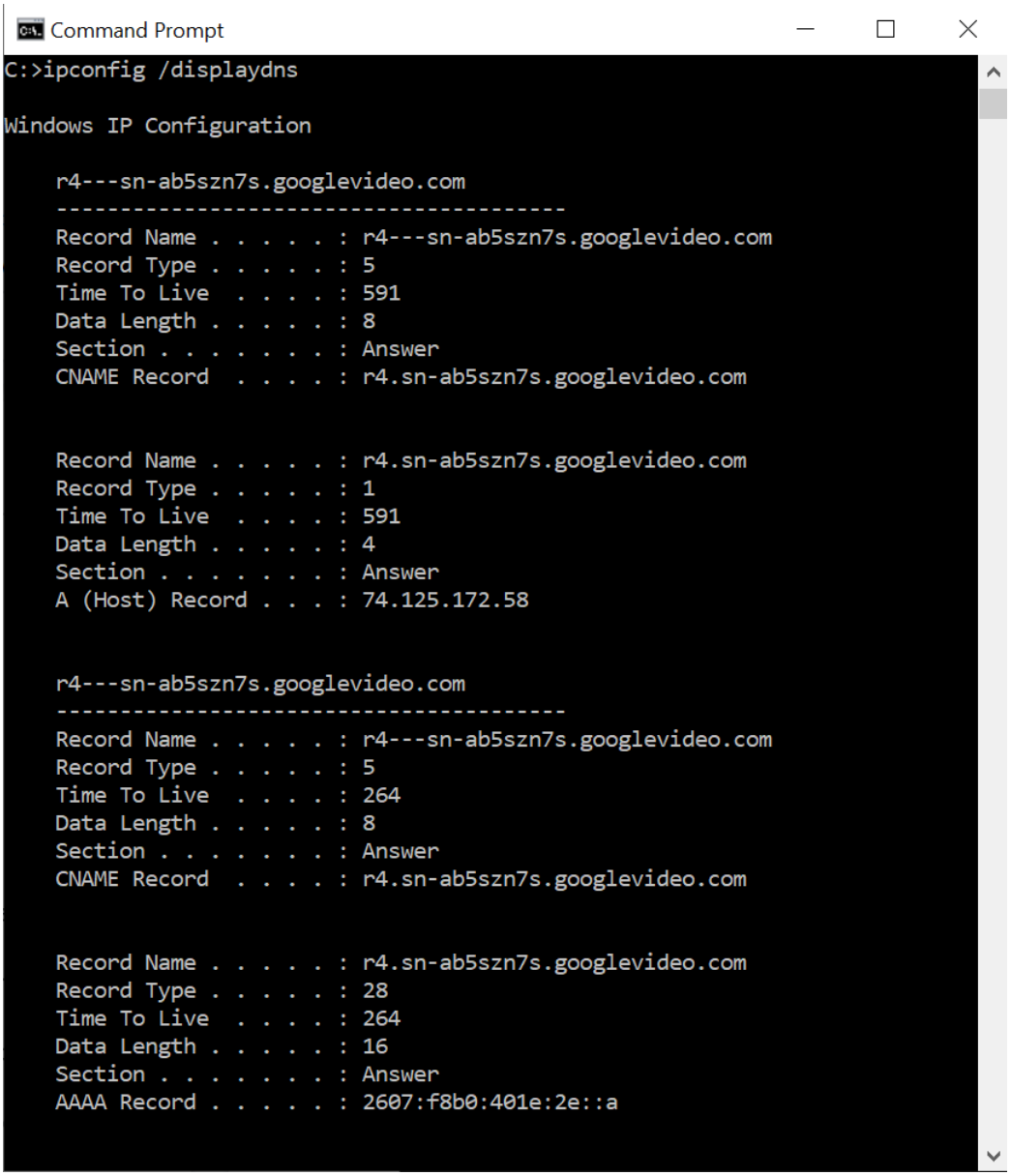
ipconfig /displaydns - View DNS Cache

When you visit a website using it's domain name (e.g., www.meridianoutpost.com), your computer will need to know the IP address for that website in order for it to find it the server hosting it on the Internet. The process of identifying the IP address is called DNS lookup (analogous to looking up a number in a phone book). Once your computer learns the associated IP address for the website you want to visit, it will cache it (store it) on your computer. The purpose of caching it is to improve performance by not having your computer perform a DNS lookup each time you access a web page on the website.

This command will list all the currently cached IP addresses on your computer (also referred to as the DNS resolver cache). If you've accessed a lot of websites since turning on your computer, this list can be very lengthy. The illustration below shows just a few entries out of many for a particular computer. If you just turned on our computer and have not access websites or servers on the network on the Internet, then you list will only show a "localhost" setting in your local host's file.

To display cached DNS entries on your computer, type the following in the command window then press Enter: ipconfig /displaydns

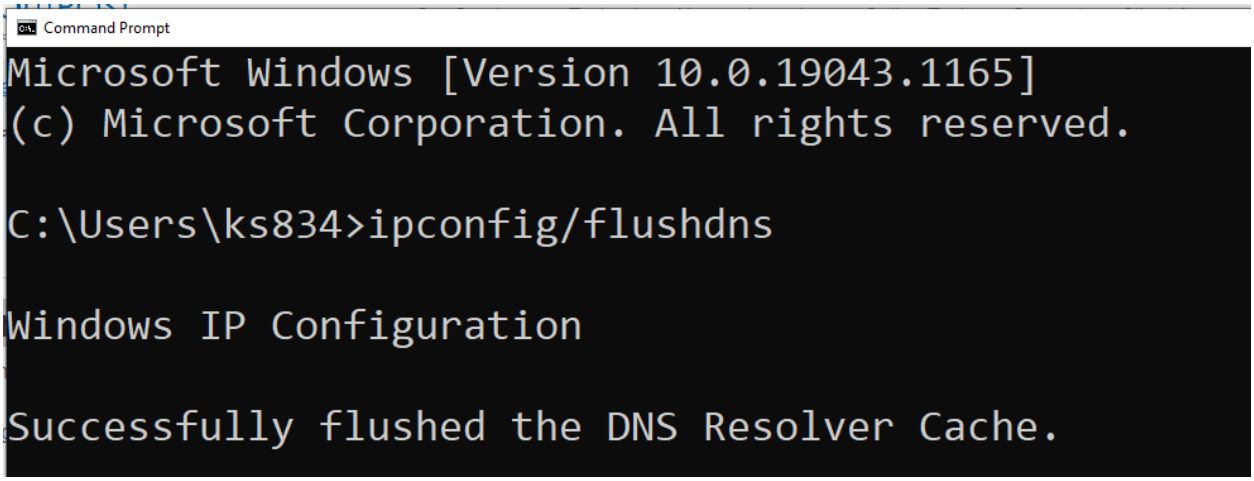
This command is typically used to troubleshoot specific DNS lookup issues. See example for ipconfig /flushdns for related information.



ipconfig /flushdns - Purge DNS Cache

This command will purge the cached DNS entries on your computer. You would typically do this to troubleshoot DNS related problems. An example of this is when you try to access a website but you encounter an error message stating the website is not found. For most people, executing this command does not have adverse effect on your computer. See example for ipconfig /displaydns for related information.

To delete all the cached DNS entries on your computer, type the following in the command window then press Enter: ipconfig /flushdns



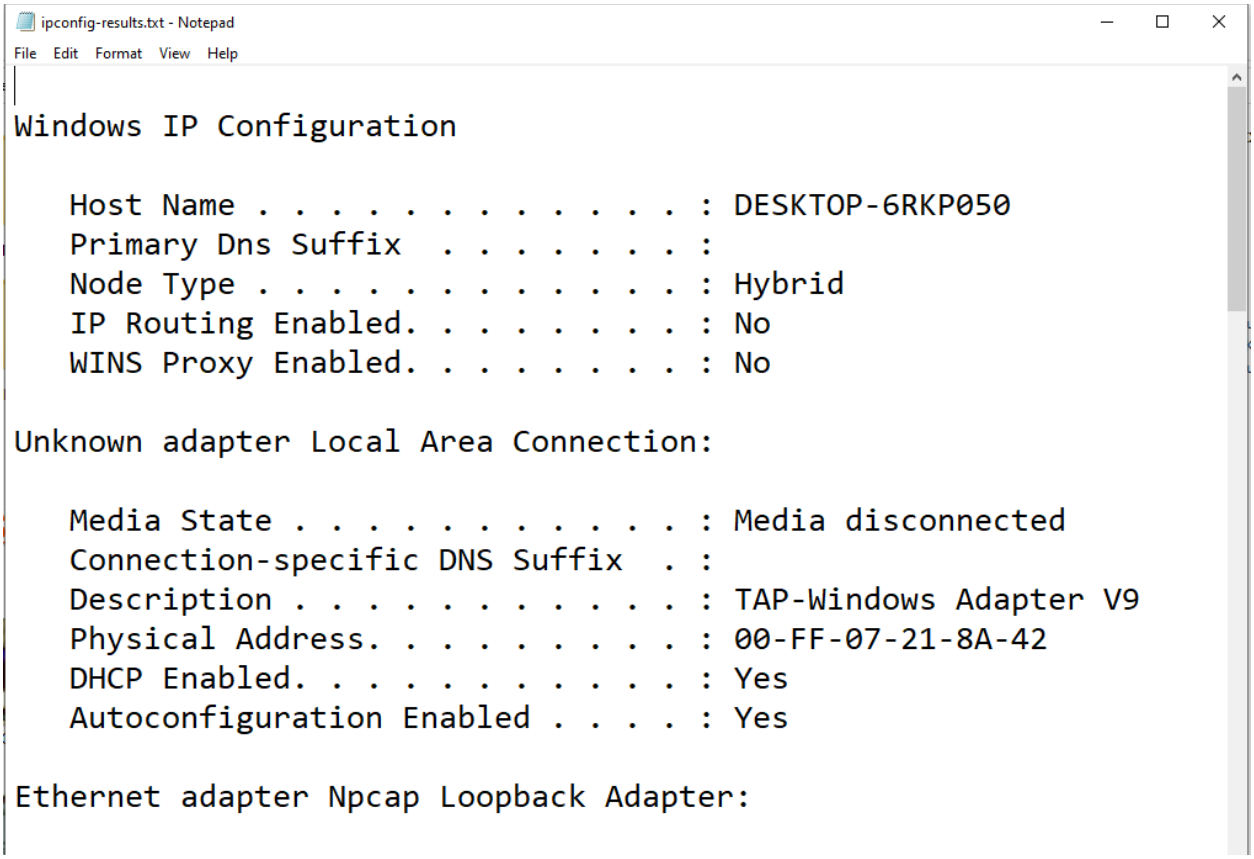
Other Usages and Getting Help

The example usage described shows only some of the functions available with ipconfig. To get a list of the available switches, type the following in the command window then press Enter: ipconfig /?


Command Prompt
C:>ipconfig /?
USAGE:
ipconfig [/allcompartments] [/? | /all |
/renew [adapter] | /release [adapter] |
/renew6 [adapter] | /release6 [adapter] |
/flushdns | /displaydns | /registerdns |
/showclassid adapter |
/setclassid adapter [classid] |
/showclassid6 adapter |
/setclassid6 adapter [classid]]
where
adapter Connection name
(wildcard characters * and ? allowed, see examples)
Options:
/? Display this help message
/all Display full configuration information.
/release Release the IPv4 address for the specified adapter.
/release6 Release the IPv6 address for the specified adapter.
/renew Renew the IPv4 address for the specified adapter.
/renew6 Renew the IPv6 address for the specified adapter.
/flushdns Purges the DNS Resolver cache.
/registerdns Refreshes all DHCP leases and re-registers DNS names
/displaydns Display the contents of the DNS Resolver Cache.
/showclassid Displays all the dhcp class IDs allowed for adapter.
/setclassid Modifies the dhcp class id.
/showclassid6 Displays all the IPv6 DHCP class IDs allowed for adapter.
/setclassid6 Modifies the IPv6 DHCP class id.
The default is to display only the IP address, subnet mask and
default gateway for each adapter bound to TCP/IP.
For Release and Renew, if no adapter name is specified, then the IP address
leases for all adapters bound to TCP/IP will be released or renewed.
For Setclassid and Setclassid6, if no ClassId is specified, then the ClassId is removed.
Examples:
> ipconfig ... Show information
> ipconfig /all ... Show detailed information
> ipconfig /renew ... renew all adapters
> ipconfig /renew EL* ... renew any connection that has its
name starting with EL
> ipconfig /release *Con* ... release all matching connections,
eg. "Wired Ethernet Connection 1" or
"Wired Ethernet Connection 2"
> ipconfig /allcompartments ... Show information about all
compartments
> ipconfig /allcompartments /all ... Show detailed information about all
compartments
C:>

Redirect Output to Text File

Instead of displaying the results on the screen, you can have the results saved automatically to a text file on your computer. To do this, simply use the ">" symbol followed by the folder path and file name of your choice. For example, to redirect the output of ipconfig /renew, type the following in the command window then press Enter: ipconfig /all >D:\ipconfig-results.txt
This will create a file named **ipconfig-results.txt** in the folder path **c:\temp** that will have your result. You can then open this file with any text editor, such as *Notepad* on a Windows computer, as illustrated below.

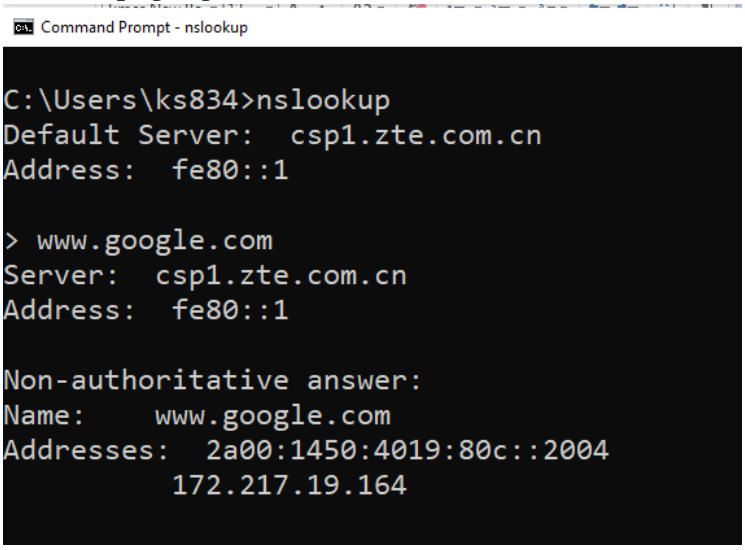


NS LookUp

Nslookup (stands for “Name Server Lookup”) is a useful command for getting information from DNS server. It is a network administration tool for querying the Domain Name System (DNS) to obtain domain name or IP address mapping or any other specific DNS record. It is also used to troubleshoot DNS related problems.

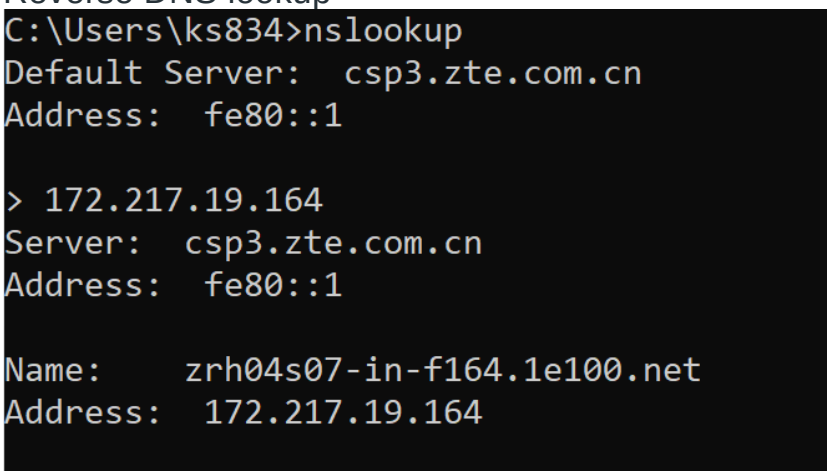
Syntax:
nslookup [option]

nslookup google.com

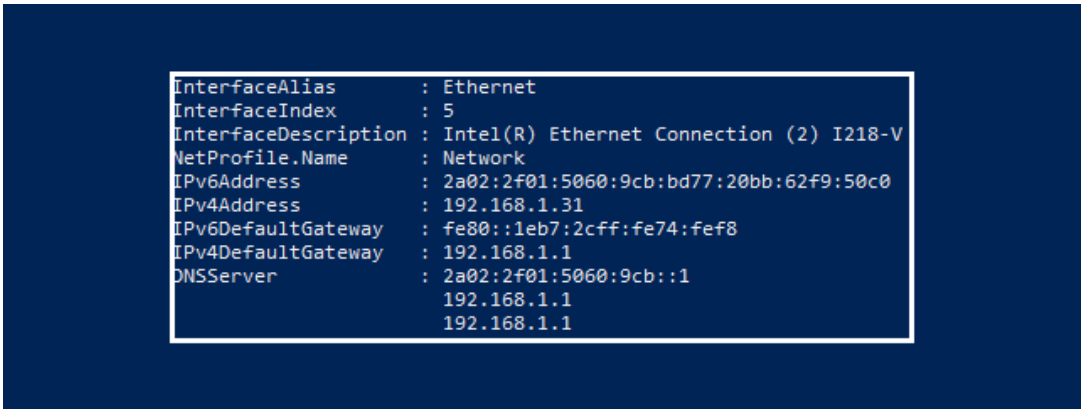


nslookup 172.217.19.164:

Reverse DNS lookup



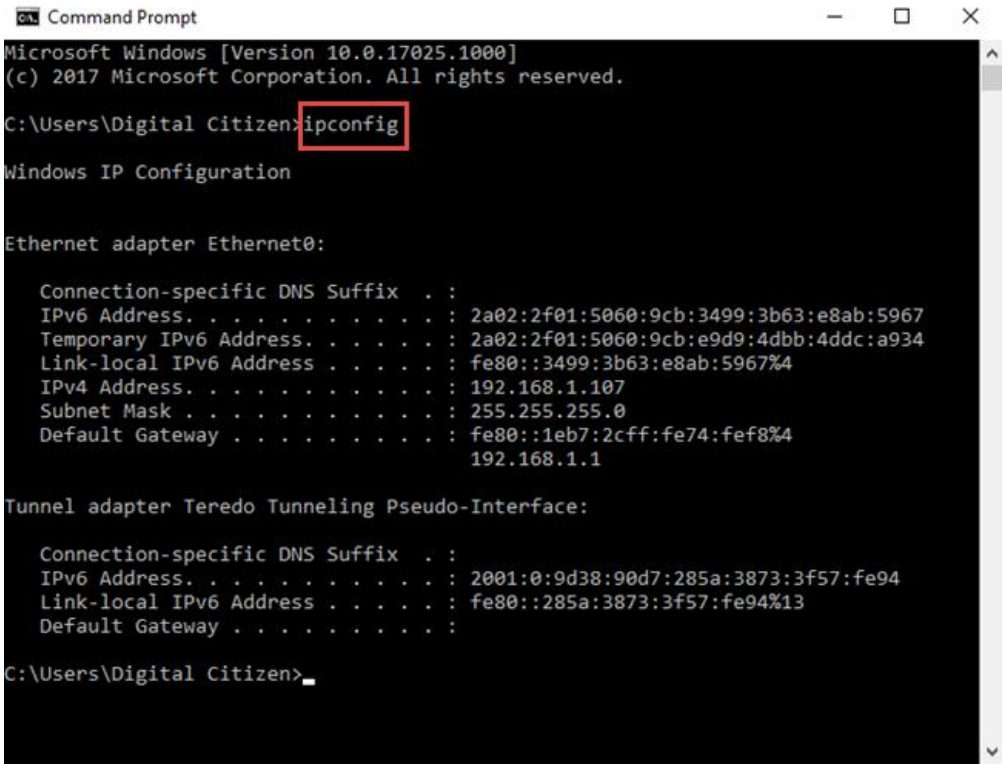
Multiple ways to find your IP address in Windows (all versions)



The IP address or Internet Protocol address is a numerical label that is used in networks to identify and locate network devices, from computers to smartphones, to printers and other devices. The IP address can be a useful piece of information, especially when you want to set up your home router or when you want to connect to other devices on a network. But how do you check a PC's IP address in Windows?

How to find your IP address from the Command Prompt (all versions of Windows)

Open the Command Prompt, type the command ipconfig and press Enter. This command lists all the network adapters (both Ethernet and wireless) found on your Windows computer, and it shows details about each of them.



For each network adapter, you get to see both the IPv4 address and the IPv6 Address.

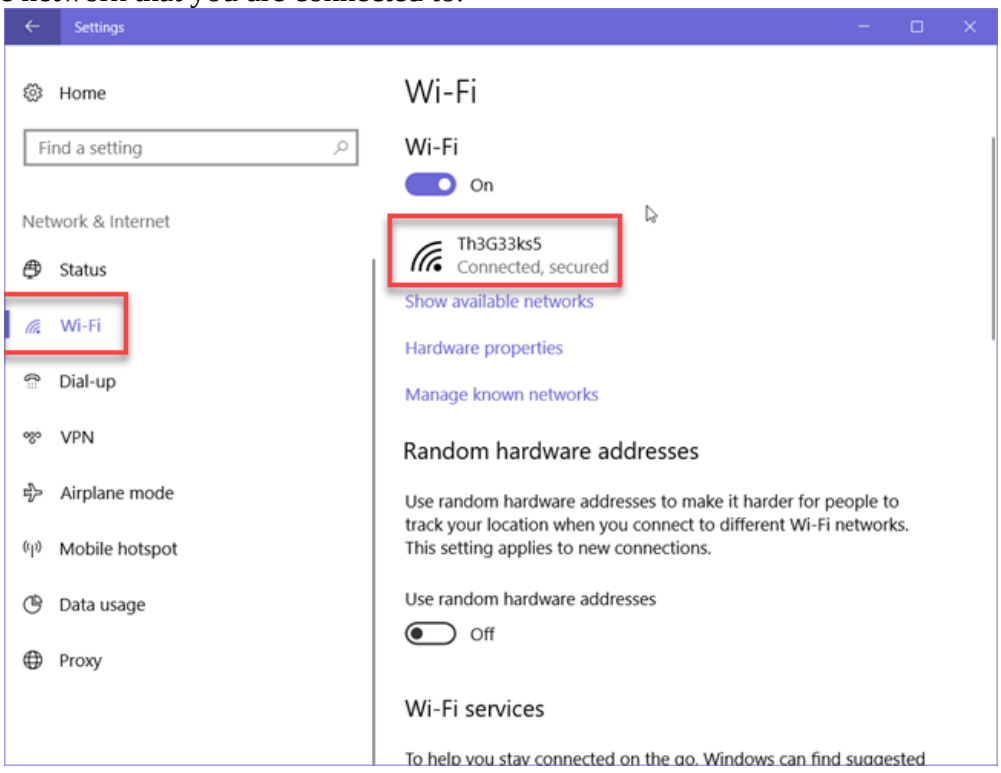
```
Ethernet adapter Ethernet0:

   Connection-specific DNS Suffix  . :
   IPv6 Address. . . . . . . . . . . : 2a02:2f01:5060:9cb:3499:3b63:e8ab:5967
   Temporary IPv6 Address. . . . . . : 2a02:2f01:5060:9cb:e9d9:4dbb:4ddc:a934
   Link-local IPv6 Address . . . . . : fe80::3499:3b63:e8ab:5967%4
   IPv4 Address. . . . . . . . . . . : 192.168.1.107
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : fe80::1eb7:2cff:fe74:fef8%4
                                       192.168.1.1
```

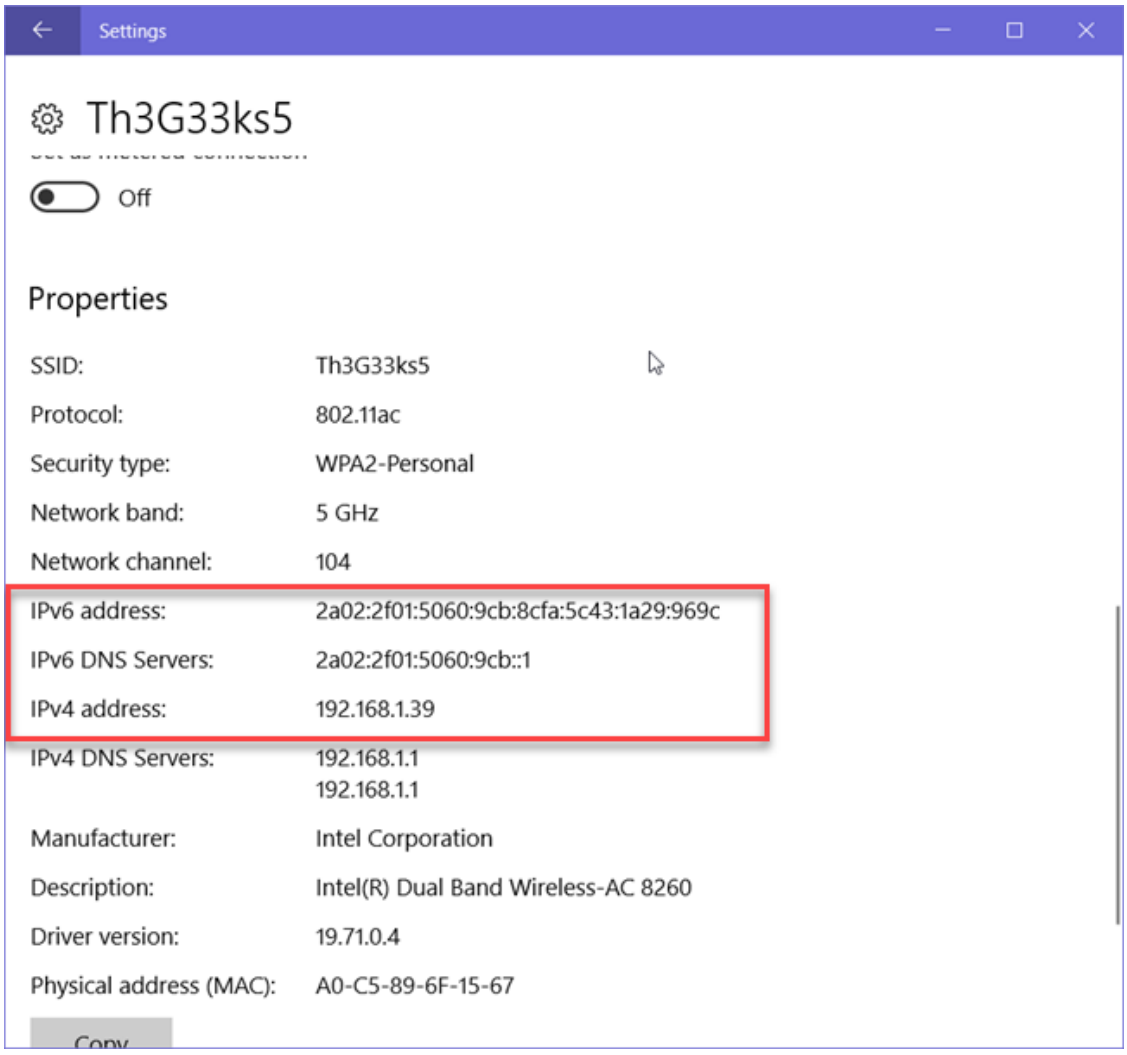
To learn more about the parameters accepted by the ipconfig command and what each of them does, run the command ipconfig /?

How to find your IP address in the Settings app (Windows 10 only)

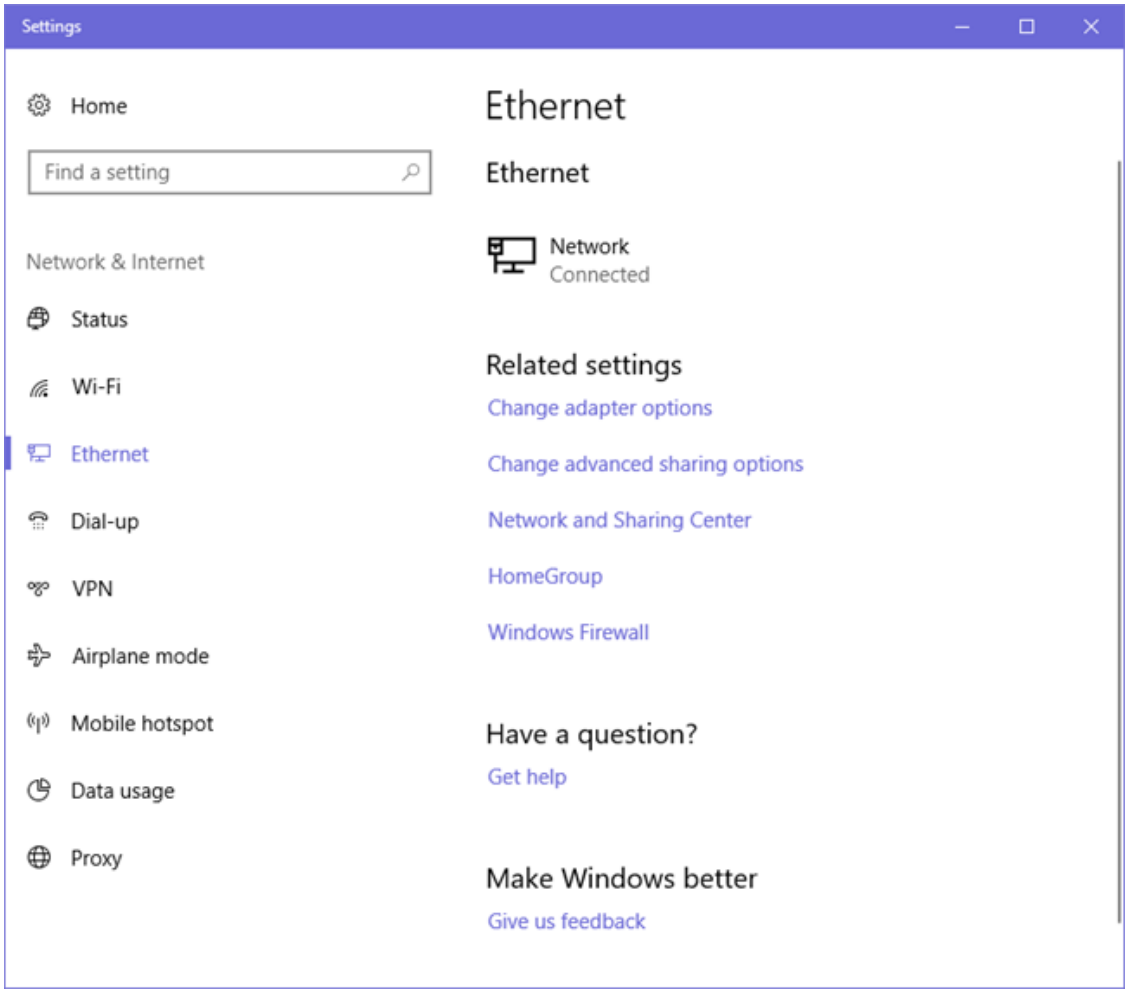
If you are using Windows 10, open the Settings app. There, go to Network & Internet. You are shown a list of networking related settings and categories. If you are connected to a wireless network, in the column on the left, choose Wi-Fi and then, on the right, click or tap on the name of the network that you are connected to.



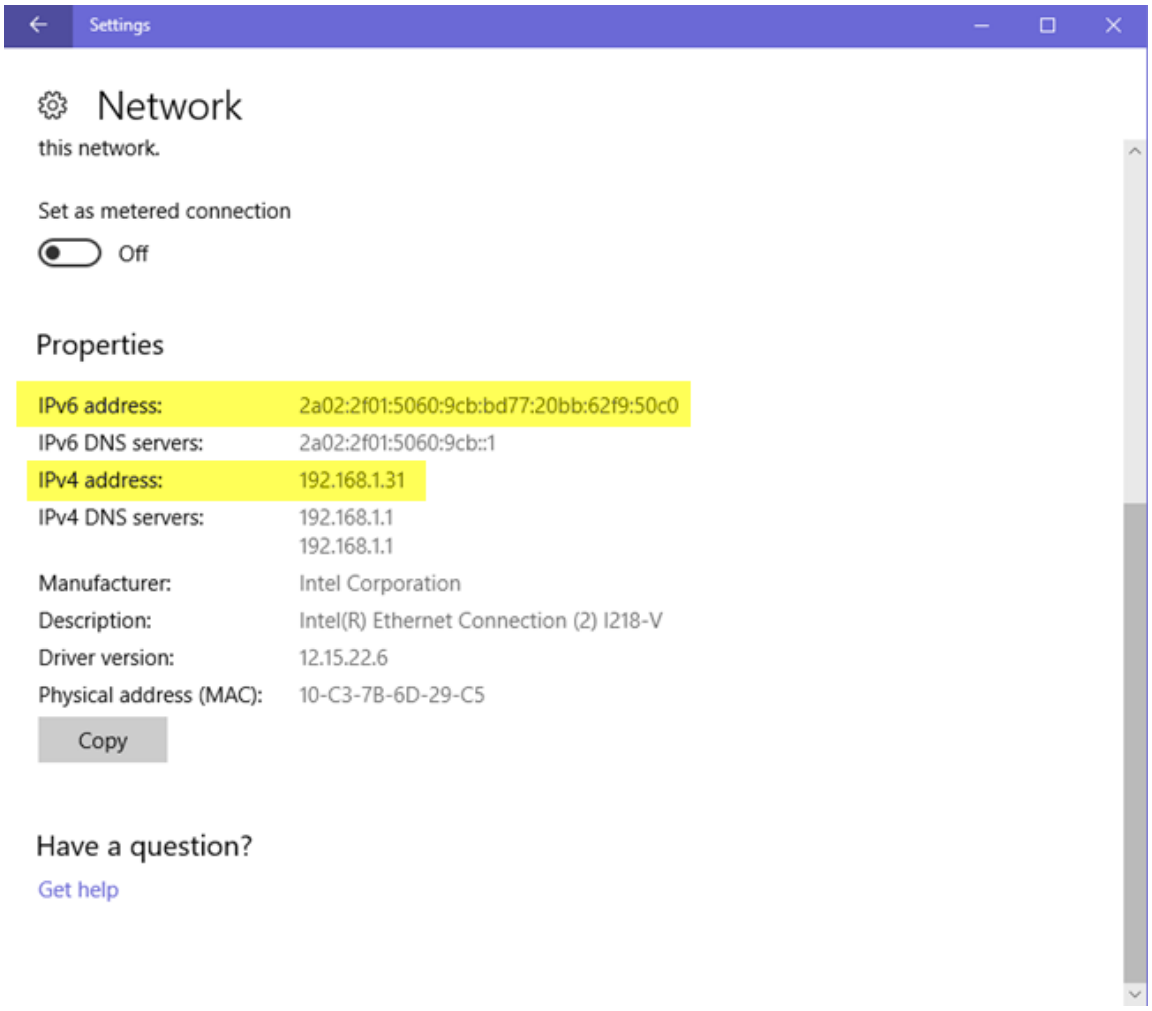
You are shown a long list of properties. Scroll down until you find the fields for the IPv6 and IPv4 addresses, highlighted below.



If you are connected using a network cable, in the column on the left choose Ethernet and then click or tap on the network name, on the right side of the screen.



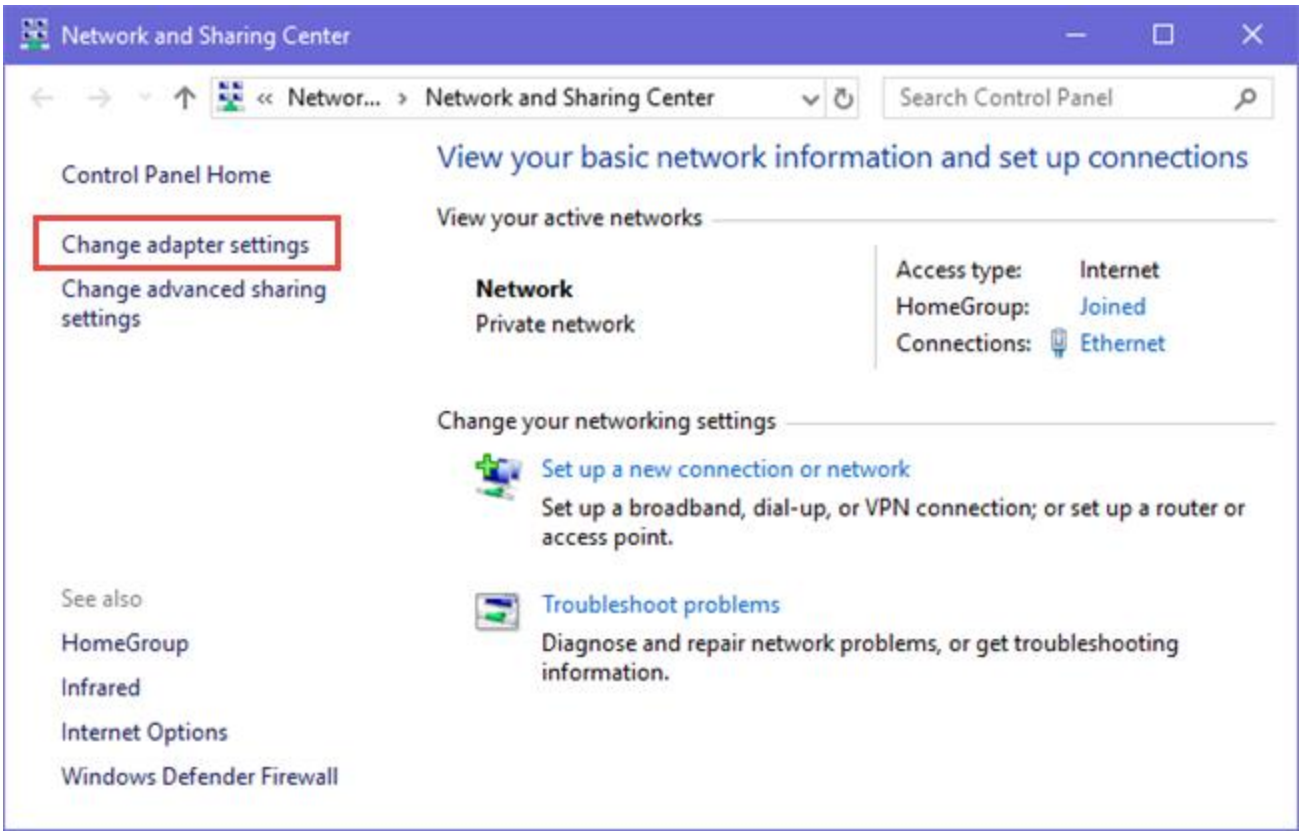
Scroll down the list of network properties until you find the entries for the IPv6 and IPv4 addresses, highlighted below.



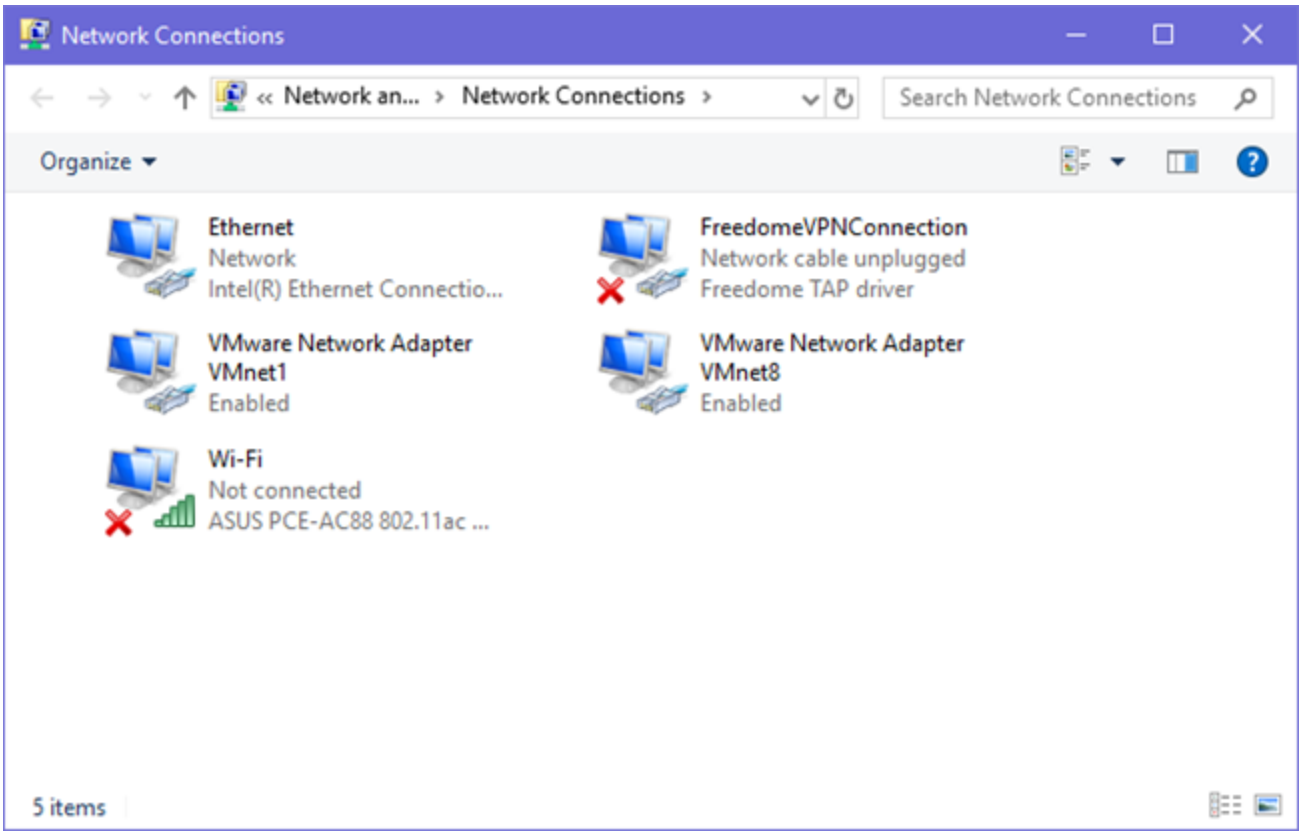
Now you can close the Settings app.

How to find your IP Address in the Control Panel (all versions of Windows)

Another geeky method that does not involve using a command is to use the Network and Sharing Center. To access it, open the Control Panel and go to "Network and Internet -> Network and Sharing Center." Next, click or tap the "Change adapter settings" link on the left.

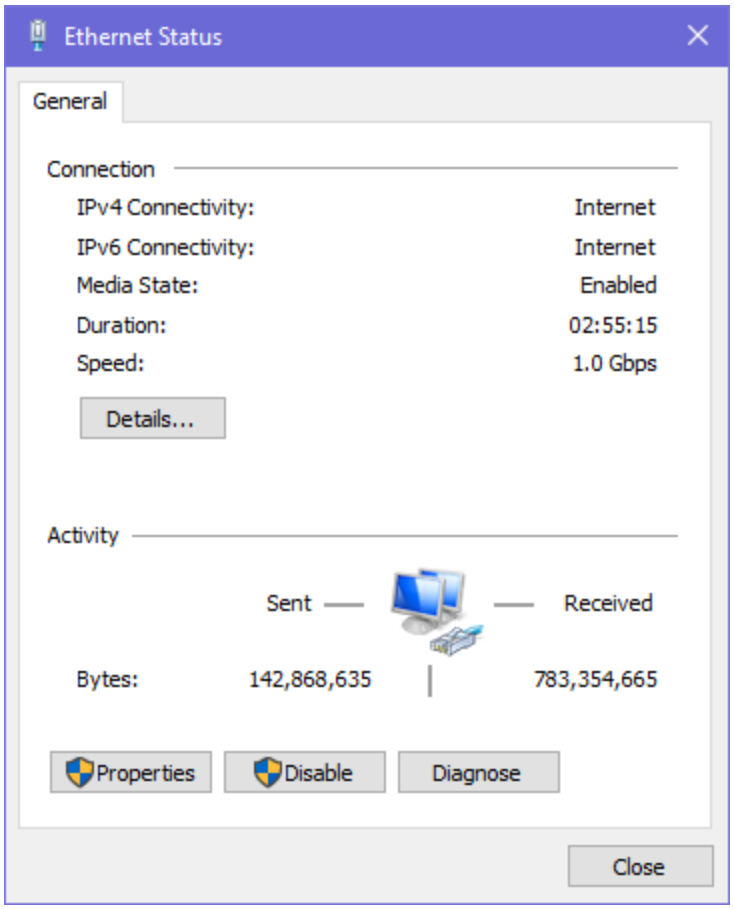


The Network Connections window is opened, listing the network adapters installed on your computer, including virtual ones, used by VPN services or virtualization apps. Double click (or double tap) the network adapter for which you want to see the IP address.



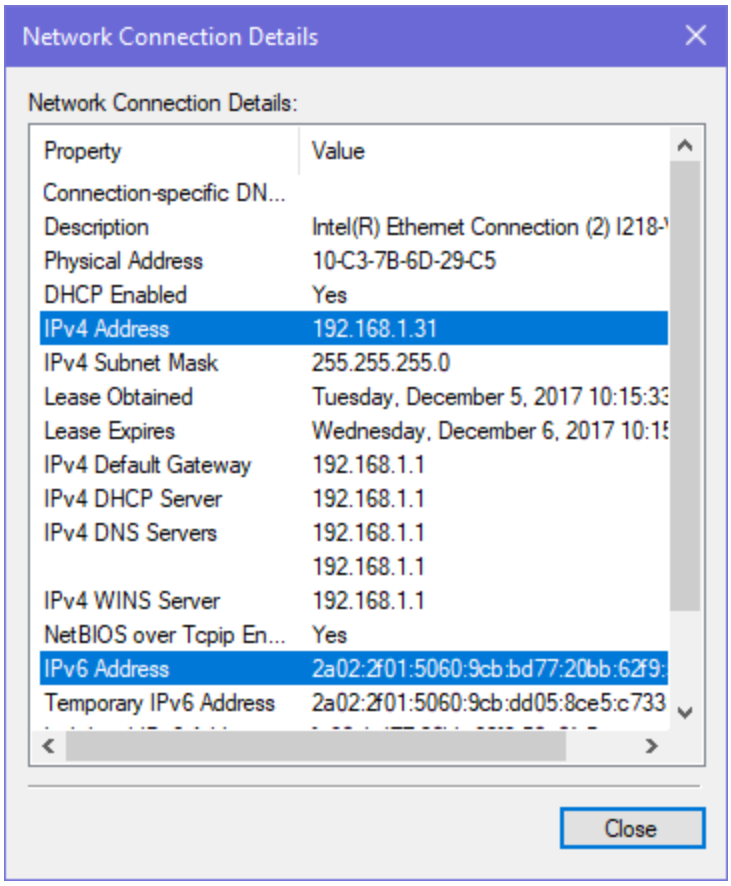
Windows, IP address, IPv4, IPv6

This action opens the Status window of that adapter. Click or tap the Details button to see a series of details about that network adapter, including its IPv4 and IPv6 addresses.



Windows, IP address, IPv4, IPv6

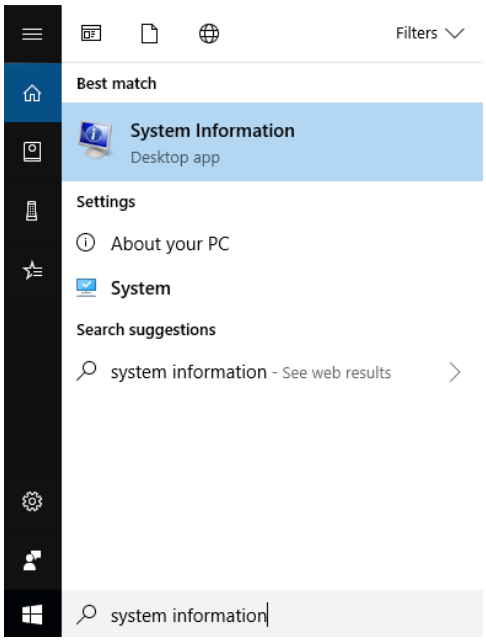
Scroll through the list of details until you find the IPv4 and IPv6 address fields, highlighted below.



When done, Close the windows you just opened.

How to find your IP address in System Information (all versions of Windows)

Another method that works in all versions of Windows is to use the System Information desktop app. You can open it by using search and typing "System Information" in the appropriate search field and clicking on the search result with the same name.

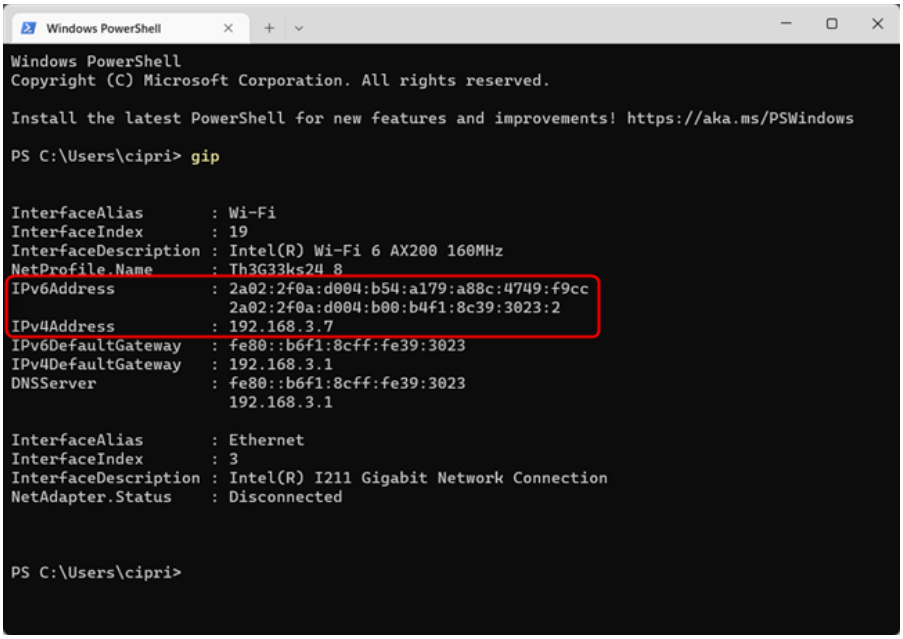


In the System Information desktop app, on the column on the left, expand Components followed by Networks and then Adapter. On the right side of the app window, you can see detailed information about each network adapter that is found on your computer. Scroll down the list until you find the network card that you are interested in. There you see a field named IP Address, giving you all the information, you need.

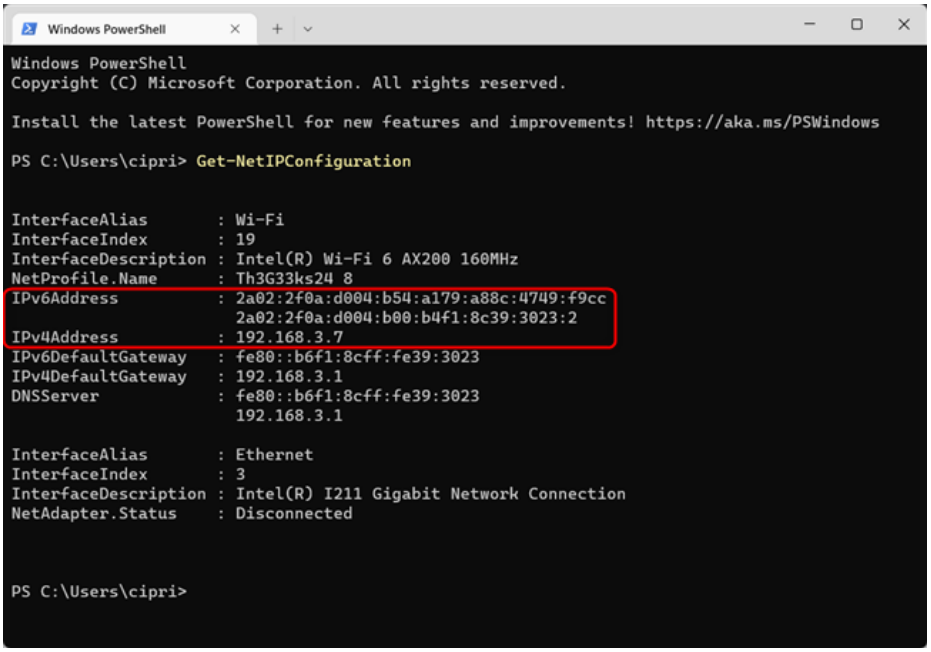
Close the System Information app when done.

How to find the IP address in PowerShell (all versions of Windows)

PowerShell is a tool similar to the Command Prompt, but it is even more powerful and allows you to work with more elements that make up Windows. PowerShell has two commands which you can use to find the IPv4 and IPv6 address of a network adapter. The first one is gip. Type it in PowerShell and then press Enter. The command triggers the display of several details about each network adapter, including their IP addresses.



Another command which returns the same results is Get-NetIPConfiguration. Type it, press Enter and then look for the information that you want.

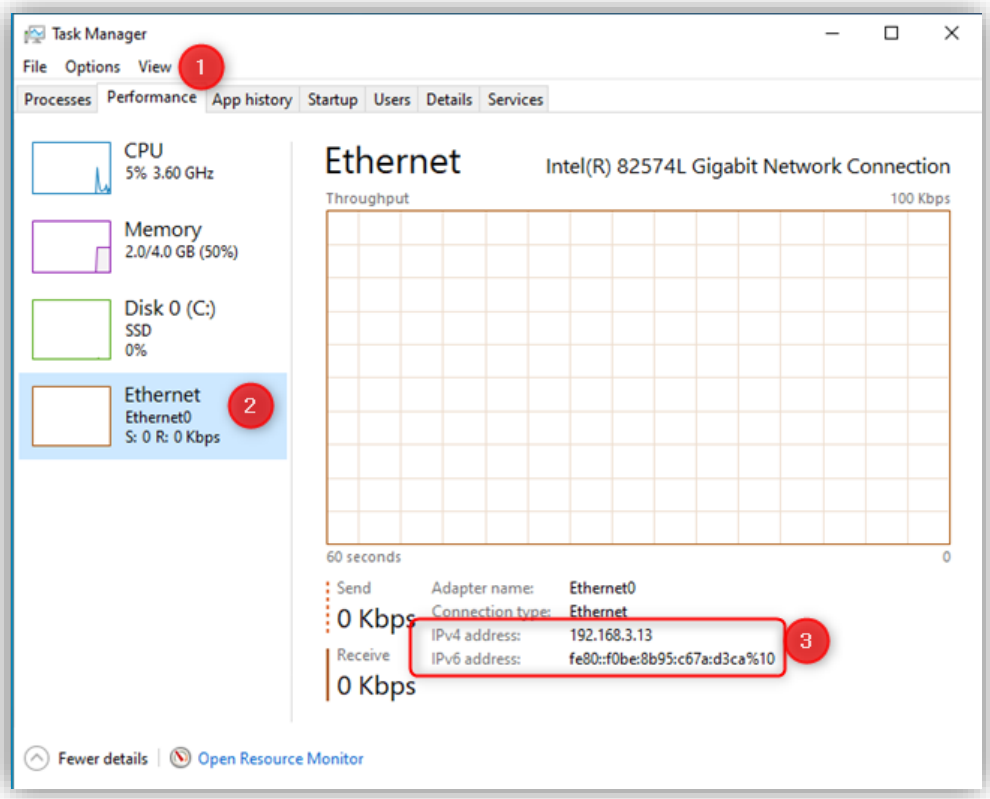


Close PowerShell when done.

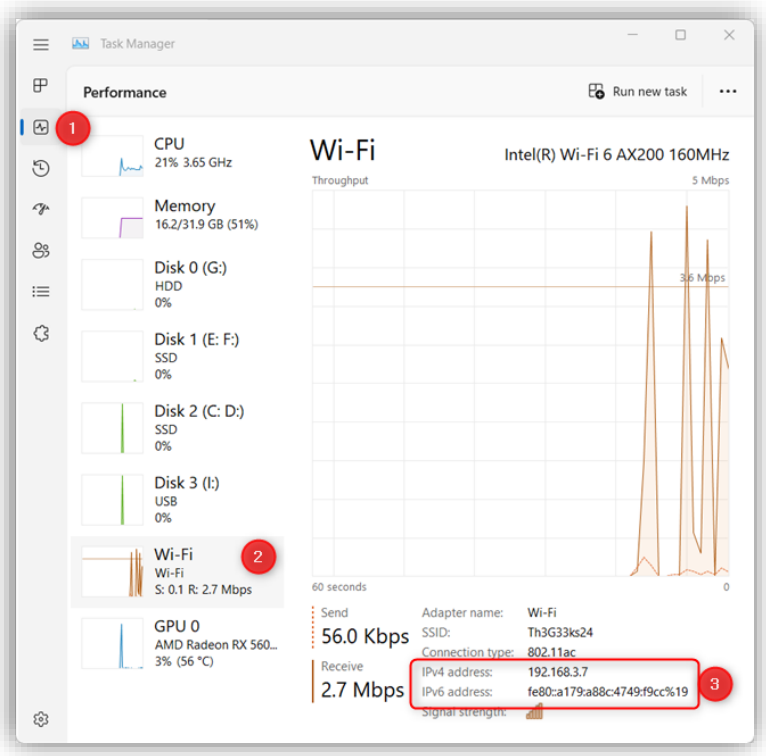
How to find your IP address in Task Manager (Windows 10 and Windows 11 only)

The Task Manager can also tell you the IP address you're using on the local network. To fire it up, press Ctrl + Shift+ Escape on your keyboard or use any of the other ways of opening Task Manager. If you're using Windows 10, and you start the Task Manager in the compact view, click or tap More details. Then, select the Performance tab and look for your network adapter. If

you are connected to a wireless network, choose Wi-Fi. If you're using a cable connection, choose Ethernet. Then, on the right side, you see the IPv6 and IPv4 addresses.



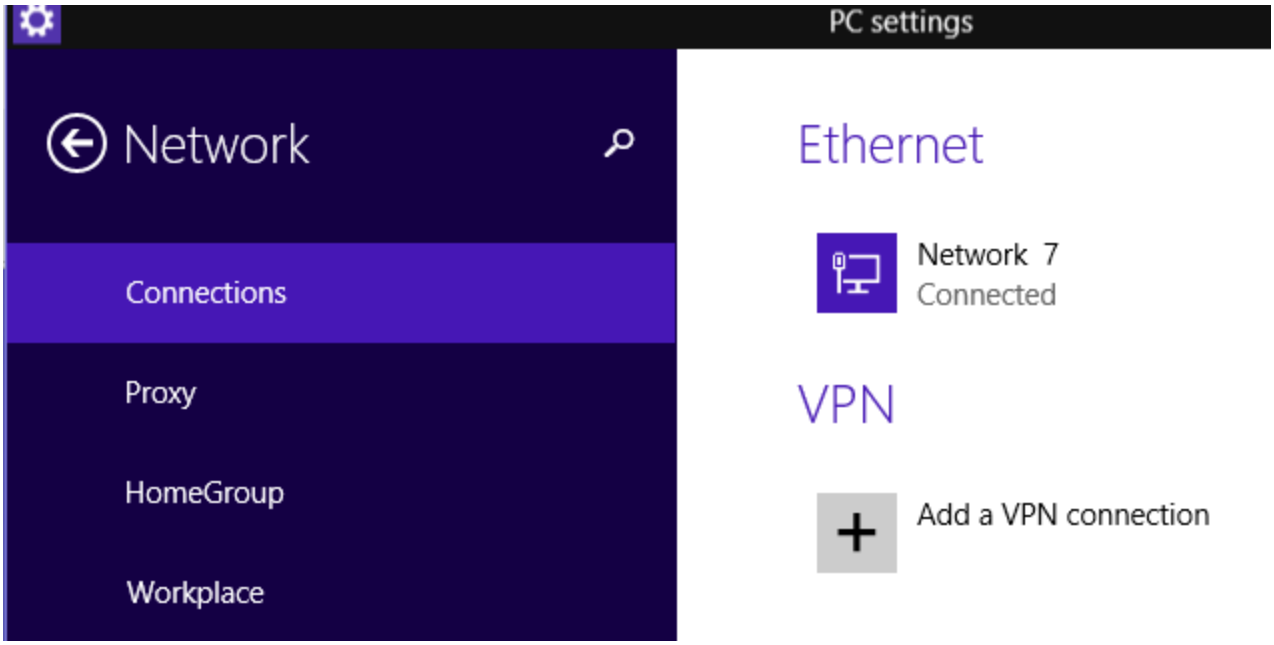
Things are similar in Windows 11. However, when you fire up the Task Manager, there's no annoying compact view. Instead, you just select the Performance tab on the left and click or tap on Wi-Fi or Ethernet, depending on your network connection. Then, on the bottom-right, you see your computer's IPv6 and IPv4 addresses.



Close Task Manager when done.

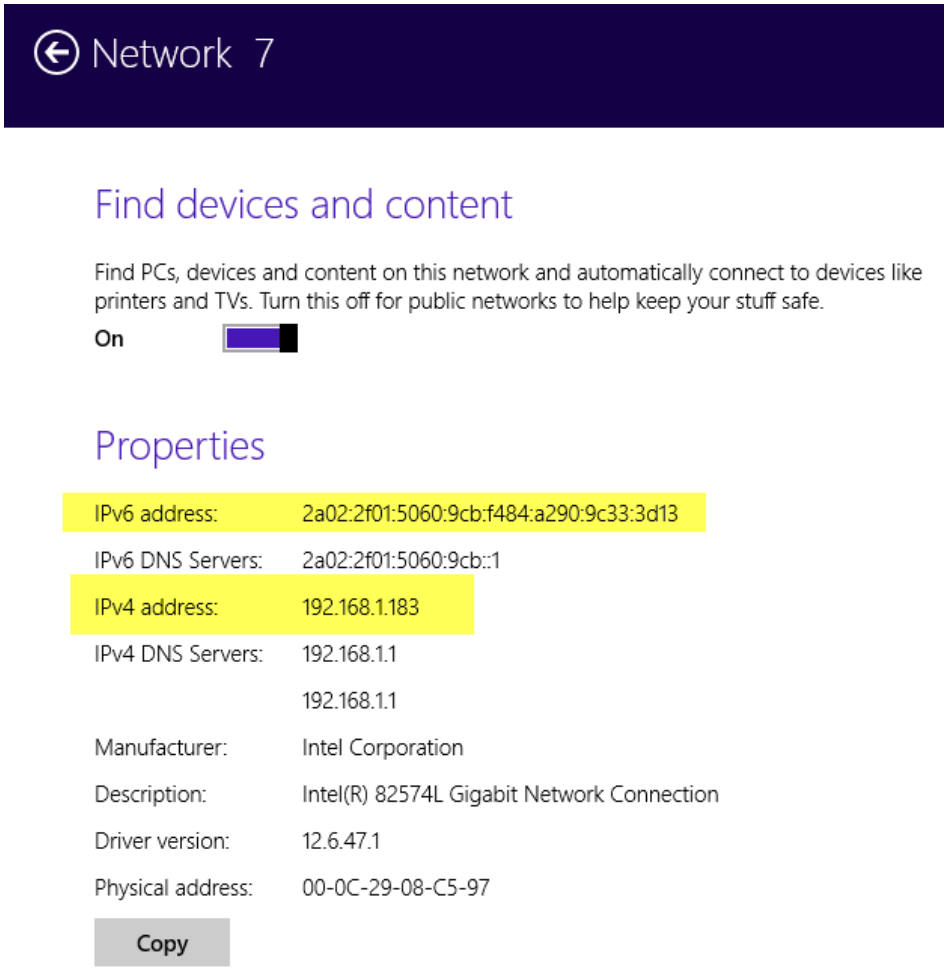
How to find your IP address in the PC Settings app (Windows 8.1 only)

If you are using Windows 8.1, open the PC Settings app. There, choose Network and then go to Connections. Here you can see the network adapter that you are using the name of the network that you are connected to. Click or tap on the network name, under Ethernet (if you are on a wired connection) or Wi-Fi (if you are using a wireless network).



Windows, IP address, IPv4, IPv6

You are shown the properties of your connection, including the IP address.



Close *PC Settings* when done

References

1. https://www.fortinet.com/resources/cyberglossary/tcp
2. https://www.techtarget.com/searchnetworking
3. https://www.meridianoutpost.com/resources/articles/command-line/ipconfig.php
4. https://docs.microsoft.com/en-us/windows-server/administration/windows-commands/ipconfig